1. A method for fabricating composite thin films comprising the steps of:
   (a) depositing a chemical precursor solution onto a suitable substrate and forming a wet film of Ta_2O_5;
   (b) baking said wet film which was deposited on suitable substrate and removing organics present in said solution;
   (c) forming a continuous Ta_2O_5 thin film on said substrate;
   (d) baking said continuous Ta_2O_5 thin film deposited on substrate under ambient conditions;
   (e) repeating steps (c) and (d) and obtaining a desired thickness of said thin film; and
   (f) annealing said continuous Ta_2O_5 thin film deposited on said substrate at varying temperatures, times and oxygen flow rates and forming said thin film-substrate heterostructure having high dielectric constants and low dielectric loss at microwave frequencies.
2. A method for fabricating composite thin films in claim 1 further comprising the step of selecting precursor compounds and solvents and forming said chemical precursor solution.
3. A method for fabricating composite thin films in claim 2 further comprising the step of dissolving said precursor compounds in said solvents and forming a homogenous solution.
4. A method for fabricating composite thin films in claim 3 further comprising the step of hydrolyzing and polycondensating said precursor solution and stabilizing said precursor solution.

5. A method for fabricating composite thin films in claim 4 further comprising the step of utilizing ambient conditions during said step (b).
6. A method for fabricating composite thin films in claim 4, further comprising the step of controlling ambient conditions during said step (b).
7. A method for fabricating composite thin films in claim 4, further comprising the step of drying said thin film between steps (a) and (b).
8. A thin film substrate-heterostructure comprising a bottom substrate layer, an intermediate Ta_2O_5 layer and a top microwave component surface.
9. A thin film substrate-heterostructure of claim 8 further comprising said bottom substrate layer selected from a group consisting of glass, single crystal and polycrystalline ceramics.
10. A thin film substrate of claim 9 wherein said intermediate layer comprises a pure Ta_2O_5 thin film.
11. A thin film substrate of claim 9 wherein said intermediate layer comprises a modified Ta_2O_5 thin film.
12. A thin film substrate comprising a bottom substrate layer, a first intermediate Ta_2O_5 layer positioned on said bottom substrate layer, a second intermediate thin film positioned on said first intermediate layer and a top microwave component surface.
13. A thin film substrate of claim 12 further comprising said bottom substrate layer selected from a group consisting of glass, single crystal and polycrystalline ceramics.
14. A thin film substrate of claim 13 wherein said second intermediate thin film comprises a suitable microwave material.

15. A thin film substrate of claim 14 wherein said suitable microwave material second intermediate layer comprises a pure Ta_2O_5 thin film.

16. A thin film substrate of claim 14 wherein said suitable microwave material second intermediate layer comprises a modified Ta_2O_5 thin film.